ROTARY HINGE MECHANISM OF PORTABLE PHONE

TECHNICAL FIELD

This invention relates to a hinge mechanism of portable phone, and more particularly to a hinge mechanism of portable phone capable of opening and closing a cover of a portable phone while can rotate the cover about a certain axis so that a front surface and back surfaces can be converted.

BACKGROUND ART

Korea Patent Application No. 10-1998-0046799 discloses a hinge mechanism of a portable phone as an example of a cover hinge mechanism of a portable phone.

The hinge mechanism of the portable phone including the hinge mechanism according to the above-mentioned application is used for rotating a cover against a body.

Such hinge mechanism can hold the cover in open or closure elastically.

Meanwhile, the cover typically has a liquid crystal display at a side thereof contacting with a face of the body. In the state of closing the cover, the liquid crystal display comes in close contact with the face of the body, resulting in that a user can watch a screen of the liquid crystal display. Thus, the liquid crystal display of the cover always is set in order to automatically turn off when the user do not put in call to someone, while only turning on when the cover opens.

Since the hinge mechanism of the general portable phone performs such that the cover is opened and closed against the body of portable phone, however, there is a problem in that the user can watch the liquid crystal display when the cover is closed.

On the other hand, the liquid crystal display can be installed on both sides of the cover, but it causes a cost of manufactusealing the portable phone to increase. Furthermore, since the liquid crystal display on an outer side of the cover is always exposed to an outer environment, there is another problem in that the liquid crystal display can be easily destroyed.

Recently, a portable phone having a camera for image communication has been developed as the portable phone including lots of additional functions has been demanded. In such portable phone, the camera is embedded in the body or one of both sides of the cover, or detachably mountained at the hinge mechanism of the portable phone.

With the above-described portable phone, the camera is always directed to the user to take a picture of user's face and then transmits the picture to someone.

Accordingly, where the user wish take a picture of the body but the his/her face, the body of portable phone or the cover which is rotatably installed to the body of the portable phone must be directed to the user's body to take the picture of the his/her body. As the result, since the user cannot watch the liquid crystal display anymore, there is another problem in that the user cannot identify whether the camera normally takes the picture of his/her body.

DISCLOSUR OF INVENTION

The present invention is contrived to overcome above-described problems. It is an object of the present invention to provide a hinge mechanism of portable phone which can help to open and close the cover of the portable phone, while makes the cover turn reversely, resulting in that a user can watch a liquid crystal display of the cover in the state of turning off the portable phone.

To achieve the object of the present invention, there is provided a hinge mechanism of a portable phone which comprises: a first hinge housing including a first rotating chamber having an upper portion opened and a first hinge chamber formed at a side of the first rotating chamber, for mechanically connecting a cover to a body; a first hinge part which is installed to the first hinge chamber, for opening and closing the cover; and a first rotary part which is installed to the first rotating chamber, for rotating the cover.

The first rotary part includes: a first cylinder which has a first cylinder chamber formed at a lower surface with opening, a first cylinder aperture formed at an upper surface, and a first arm projected from upper portion to be combined with the cover; a first compressed spring installed to the first cylinder chamber; a first slip member which has a first slip opening at a center thereof and which is installed under the first compressed spring to the first cylinder chamber; and a first center shaft which is formed at a bottom surface of the first rotating chamber so as to sequentially extend through the first slip opening, the first compressed spring, the first cylinder chamber and the first cylinder aperture.

A pair of leaf spring inserting holes is formed on an outer peripheral surface of the first cylinder, and a pair of leaf spring installing holes is formed on an outer peripheral surface of the first slip member, in which a pair of leaf springs is respectively installed in the leaf spring inserting holes such that a center portion of the leaf spring is inserted in the leaf spring inserting hole.

A first center projection is formed on a peripheral surface of the first center shaft, and a first slip groove is formed on an inner surface of the first slip member, in which the first center projection is inserted.

A first cylinder projection is formed on the an outer peripheral surface of the first cylinder, and a pair of first stoppers is formed on an inner surface of the first cylinder opposite to the first rotating chamber, to which the first cylinder projection is latched.

The first housing has a first cutoff portion through which a wire enters the first rotating chamber to electrically connect the cover to the body.

A first annular groove is formed at an end of the first center shaft, in which a first sealing is fixedly inserted so as to fix the first cylinder to the first center shaft.

The first hinge chamber has an end opened and includes a first guide recess formed from an opening end to an interior thereof, wherein the first hinge part includes a first hinge spring which is installed in the first hinge chamber; a first rotary hinge part which is inserted in the first hinge chamber at an outside of the first hinge spring, which has a first rotary hinge aperture formed at a center thereof, of which a first rotary hinge projection is formed on an outer surface, and which has a first rotary hinge surface continuously extending to the first rotary hinge aperture while having two-wave type of bending when rotating each time; a first rotary fixing part which has a first fixing hinge hole formed opposite corresponding to the firs rotary hinge aperture so as to enclose the first fixing hinge part and which has a first fixing hinge surface corresponding to the first hinge surface at a side thereof and a first fixing hinge projection formed on the other side to be fixed to the body; and a first hinge shaft extending through the first fixing hinge hole, the first rotary hinge aperture and the first hinge spring to be fixed to the first hinge chamber.

The first hinge chamber opens at a top portion thereof, which has a first hinge chamber hole formed at a side surface